

2 a spring bow recess in the tubular body for
3 receiving a portion of each spring bow as each spring bow
4 moves inwardly toward the tubular body. ¹³
1 ~~16~~ 35. The centralizer apparatus of claim ~~32~~ further comprising
2 retainer apparatus on the tubular body for holding
3 the spring bow second ends and guiding their movement.
1 ¹² 36. The centralizer apparatus of claim ~~31~~ wherein the first
2 ends of the spring bows are below the second ends of the spring
3 bows so that the centralizer apparatus is pullable into a hollow
4 tubular member upon downward movement of the centralizer apparatus
5 toward and into the hollow tubular member.

REMARKS

Claims 1 - 20 have been rejected for various reasons under §§ 102, 103, and 112. These claims have been cancelled. The new claims presented here (21 - 36) correspond to some of the cancelled claims.

New Claim / Old Claim(s)

| | | |
|----|------|------|
| 21 | ---- | 1, 2 |
| 22 | ---- | 3, 4 |
| 23 | ---- | 5 |
| 24 | ---- | 6 |
| 25 | ---- | 8 |
| 26 | ---- | 10 |
| 27 | ---- | 11 |
| 28 | ---- | 12 |
| 29 | ---- | 13 |
| 30 | ---- | 14 |
| 31 | ---- | 15 |
| 32 | ---- | 16 |
| 33 | ---- | 17 |
| 34 | ---- | 18 |
| 35 | ---- | 19 |
| 36 | ---- | 20 |

§ 112 Objection

The Specification has been objected to under § 112 on the

basis that the claimed grooves in the tubular body will cause it to fail.

Applicants do not claim any embodiment that fails. Applicants claim only those embodiments that are operable, i.e., those embodiments with grooves of such an extent that the tubular body having the groove(s) will not fail. Also Applicants note that in no claim are they claiming simply a tubular that is introduced into and used in a wellbore — but rather they are claiming a tubular with a centralizer. The centralizer has a collar in the groove or grooves and, to some extent, the centralizer itself protects the tubular and inhibits flexing of the tubular.

Applicants note that the API Specification for Casing, Tubing, and Drill Pipe (37 in Edition, May 31, 1984) defines wall thickness and permits a 12.5% tolerance in wall thickness (copies of pp. 4, 5, 21, 35 submitted herewith).

Applicants submit herewith excerpts from a publication entitled "Testing of Casing Under Extreme Loads," Dr. Ing. Gerhard Krug, 1983, which states that for certain grooves "These stresses likewise did not exert any serious effects on the collapse strength..." (p. 121); that for casing meeting the 12.5% wall thickness tolerance "the decrease in collapse strength amounts to less than 2 percent" (p. 22); and "Variations in wall thickness over a casing cross section, with a deviation of 12.5 percent from the nominal value exert only a slight influence on the collapse strength." (p. 24). This study included an extreme case of removal of 50% of a tubular's wall thickness. (p. 123).

Applicant notes that U.S. Patent 5,238,062 discloses a grooved tubular that is operable with a centralizer and which does not fail due to the presence of the groove (copy of U.S. 5,238,062 attached, co-owned with the present invention).

Clearly one of skill in the art who has the benefits of the teachings of the present invention also has available the necessary information to properly size and configure the groove(s) of the claimed subject matter herein so that the apparatus does not fail

due to the groove(s). (Submitted herewith pp. 22, 24, 120 - 124, Tables 9.5 on pp. 166, 167 of Krug.)

§ 101 Rejection

Claims 1 - 20 have been rejected under § 101 as claiming inoperative subject matter. Applicants repeat here the remarks above regarding the § 112 Objection. Applicants here claim only operative embodiments of their invention with groove(s) that will not cause tubulars to fail.

§ 112 Rejections

Claims 3, 4, 7, 8, 13, 15, 17 and 18 have been rejected under § 112 as being indefinite.

New claim 22 (old claim 3) clarifies how ends of the spring bows are connected to various structures.

New claim 31 (old claim 15) clarifies how ends of the spring bows are connected to various structures.

New claim 33 (old claim 17) recites a "hollow tubular member" instead of an "another member".

§ 102 Rejections

Claims 1, 9 - 12, 14, 16, 17, 19 and 20 have been rejected under § 102 based on Clark (U.S. 2, 605,844). These claims have been cancelled.

The new claims presented here corresponding to the cancelled claims recite:

- a first groove in the tubular body in which the first collar moves up and down

Clark has no such groove, nor a collar movable therein.

Claims 1, 3, and 13 have been rejected under § 102 based on Clay (U.S. 4,011,907) or Comstock (U.S. 2,828, 824). These claims have been cancelled.

New claims 21, 22, and 29 recite these limitations

- a first groove in the tubular in which a first collar moves

New claims 22 and 29 recite

- a second groove in the tubular in which the second collar moves

Neither Clay nor Comstock has any such groove, grooves, or collar(s) movable therein.

§ 103 Rejection

Claims 2, 4 - 8, 15 and 18 have been rejected under § 103 as unpatentable over Clark in view of Clay or Comstock and Solum (U.S. 3,200,884). These claims have been cancelled.

New claims 21, 22 - 25, 31 and 34 recite a centralizer apparatus with one or two grooves in which move a collar having spring bow ends attached thereto. Applicant repeats here the remarks above about the Clark, Clay, and Comstock references. Applicants agree with the Examiner that Clark, Jr. and Clay '907 or Comstock '824 do not show the first and second groove for limiting collar movement (Office Action, page 6, lines 4 - 8). Solum does not remedy the deficiencies of these references.

Solum has no teaching or suggestion of using a groove in a tubular in which a collar moves and which has side walls for limiting collar movement. On the contrary, Solum uses collars 11 and 12 which do not move in grooves and whose movement is limited by additional stop collars 17, 18 which must be separately manufactured and separately applied to well pipe 9.

No prior art of record other than Applicant's disclosure teaches or suggests the use of a groove on a tubular body in which a collar moves and which limits collar movement. Solum's device must have 4 collars, including 2 stop collars, to provide for limited axial movement. Applicants' device achieves this without such additional stop collars and with only two collars to which spring bow ends are attached (or as in certain embodiments of claim



one groove and one collar).

Regarding new claims 23, 24, and 34, no cited art teaches or suggests recesses in a tubular for receiving a portion of a spring bow. Regarding new claim 35, no cited art teaches or suggests the claimed retainer apparatus.

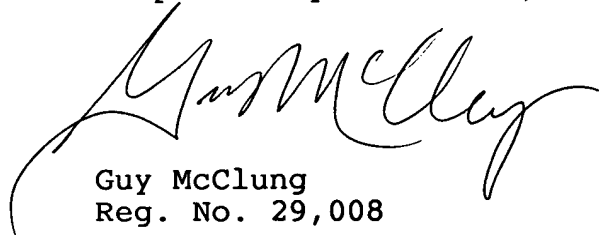
Drawings

Applicants respectfully request that they be permitted to file formal corrected drawings upon receipt of a Notice of Allowance.

Conclusion

Applicant appreciates the careful and detailed Office Action. This is intended to be a complete Response to the Office Action. Early and favorable reconsideration is respectfully requested.

Respectfully submitted,


Guy McClung
Reg. No. 29,008

Date: 17 June 96

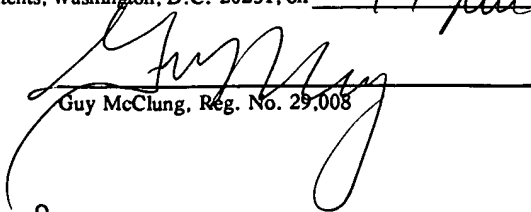
Suite 347
16690 Champion Forest Drive
Spring, TX. 77379--7023

Phone: 713 893 5244

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Guy McClung, Reg. No. 29,008